

Dense QAM Array Power Supply Unit



Bringing the **Interactive
Experience
Home**™

Please Read This Entire Guide

Important

Please read this entire guide before you install or operate this product. Give particular attention to all safety statements.

Dense QAM Array Power Supply Unit



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Safety Precautions

Read and Retain Instructions

All electrically powered units can be dangerous. We have taken great care to ensure safety during the design and production of our units. Incorrect installation, handling or component replacement can, however, impair safety.

Safety guidelines in this manual and labels or instructions on the unit are provided to warn users and service personnel about residual risk.

Carefully read all safety and operating instructions before operating this product, and retain them for future reference.

Warning and Caution Icons



WARNING:

Avoid personal injury and product damage! Do not proceed beyond any icon until you fully understand the indicated conditions.

The following icons alert you to important information about the safe operation of this product:



You will find this icon in the literature that accompanies this product. This icon indicates important operating or maintenance instructions.



You may find this icon affixed to this product. This icon indicates a live terminal; the arrowhead points to the terminal device.



You may find this icon affixed to this product. This icon indicates a protective earth terminal.



You may find this icon affixed to this product. This icon indicates excessive or dangerous heat.

Service Personnel, Users and Operators

The terms defined below are used frequently in this manual. The definitions given are based on definitions in the safety standards in question, but partially simplified to help the explanation.

The term **service personnel** applies to trained and qualified individuals who are allowed to install, replace or service electrical equipment. The service personnel are expected to use their experience and technical skills to avoid possible injury to themselves and others due to hazards that exist in service and restricted access areas.

The term **user or operator** applies to all other persons than service personnel.

Guidelines for Users

Precautions

The following precautions are applicable to users:

To prevent electrical shock or fire hazard:

- Do not remove covers.
- No operator serviceable parts inside.
- Refer servicing to qualified personnel.
- Do not expose this unit to rain or moisture.
- Disconnect the main- and backup-power before changing fuses.

For continued protection against risk of fire:

- Replace only with the same type and rating of fuse.

Guidelines for Service Personnel

General

The specific warnings and precautions in the sections below are applicable to service personnel.

Requirements for the Installation Site

You should select the installation site carefully. Observe the following rules:

- Protective Earth

The protective earth lead of the building installation should comply with the national and local requirements.

- Environmental Condition

Keep in mind that electronic equipment requires a dry and clean environment with proper ventilation and cooling facilities. High-humidity conditions can cause corrosion and degradation of electrical components. At all times the installation site should be dry, clean and ventilated. Temperature extremes can cause a variety of problems such as product failure, hardware damage, etc. Ensure that the product is operated in an environment that meets the requirements as stated in the unit's technical specifications.

Electrical Shock Hazard

Electrical shock can cause personal injury or even death. At any time you must avoid direct contact with dangerous voltages. The protective earth connection is essential to safe operation and must be verified before connecting the power supply. You should know the following safety warnings and guidelines:

- Dangerous Voltages

- Product installation or replacement must be performed by service personnel only.
- Only service personnel are allowed to remove chassis covers and access any of the components inside the chassis.
- After service, assemble the unit and ensure it is safe to use before you put it back in operation.

- Earthing

- Do not violate the earth protection by using an extension cable, power cable or autotransformer without a protective earth conductor.
- Take care to maintain the protective earthing of the unit during service or repair and to re-establish it before you put it back in operation.

Continued on next page

Guidelines for Service Personnel, Continued

Fire Hazard

Incorrect use or installation of electrical equipment can cause a risk of fire. Be aware of the following:

- Ventilation
Slots and openings in the product housing are provided for ventilation. Do not block these openings and slots as insufficient airflow can be unsafe and cause fire.
- Critical Component Replacement
For continued protection against risk of fire; replace critical components only with components of the same type and rating.
- Fuse Replacement
Replace fuses only with fuses of the same type and rating.

Precautions

Be aware of the following general precautions and guidelines:

- Wristwatch and Jewelry
For your personal safety and to avoid damage of the unit during service and repair, *do not* wear electrically conducting objects such as wristwatch or jewelry.
- Lightning
Do not work on the product, or connect or disconnect cables during periods of lightning.
- Labels
Do not remove any warning labels. Replace damaged or illegible warning labels with new ones.

ESD

Electrostatic discharge (ESD) results from the static electricity build up on the human body and other objects. This static discharge can degrade components and cause failures.

Observe the following rules to reduce ESD effects:

- Do not attempt to open a unit without proper precautions against electrostatic discharge such as:
 - Use a wrist or ankle strap.
 - Use an anti-static tablemat when working inside a product.
- Keep components in their anti-static packaging until you install them.
 - Avoid touching electronic components when installing e.g. a module.

Continued on next page

Guidelines for Service Personnel, Continued

EMC

To meet the EMC requirements of Directives 89/336/EEC and 93/68/EEC you must use correctly shielded cables of good quality for all external connections, except the power, when installing the unit.

Observe the following rules:

- Make sure that all multi-connector cables have conductive connector housings with shielded clamps. Exceptions from this general rule will be clearly stated in the connector description for the excepted connector in question.
- Make sure that the coaxial cables are of the double-braided type.

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Warranty and Disclaimer

Statement

Scientific-Atlanta (S-A) warrants good title to any hardware furnished by it. S-A warrants that during the Warranty Period as defined below services will be performed in a good and workmanlike manner. S-A also warrants that during the Warranty Period, each item S-A delivers (other than separately licensed software and services) (an "Item") will be free from material defects in workmanship and materials and under ordinary use, conform in all material respects to its published specifications current at the time the Item was shipped, downloaded, otherwise delivered to Customer. During the Warranty Period, S-A will use reasonable commercial efforts to correct errors detected in licensed software after receiving notification of such errors from Customer.

Items may include refurbished goods, subassemblies, or components, which S-A warrants as provided in this section.

Warranty Period

The Warranty Period begins on the date the Item is delivered and extends for 12 months for hardware and 90 days for software, parts, and services. S-A will repair or replace, at its option, any product that fails to satisfy this Warranty and that is returned to S-A by Customer at Customer's expense during the Warranty Period, unless the failure was the result of shipping; improper installation, maintenance or use; abnormal conditions of operation; attempted modification or repair by Customer; or an act of God. S-A will re-perform any services that do not conform to this Warranty provided S-A has received notice of non-conformance within the Warranty Period.

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Customer's Responsibility

Customer must pay packing, crating, and transportation costs to and from the factory.

At Customer's request, S-A will make reasonable efforts to provide warranty service at Customer's premises, provided Customer pays S-A's then current rates for field services and the associated travel and living expenses.

Continued on next page

Warranty and Disclaimer, Continued

Customer acknowledges its responsibility to use all reasonable methods to prove out and thoroughly test the operation of and output from Licensed Software prior to its use in Customer's operations.

Unless otherwise provided in a separate writing, and subject only to the warranty of this Section, S-A is under no obligation to provide Customer with any modifications, updates, additions, or revisions to licensed software, or to maintain licensed software in any manner.

In the event that any modifications that have not been authorized by S-A are made to licensed software, any and all warranty and other obligations of S-A shall immediately cease with respect to such software.

Claims Under This Warranty

In case of a claim under this warranty, Customer should do the following:

1. Notify S-A by giving the Item model number, serial number, and details of the difficulty.
2. On receipt of this information, Customer will be given service data or shipping instructions.
3. On receipt of shipping instructions, forward the Item prepaid.
4. If the Item or fault is not covered by warranty, an estimate of charges will be furnished before work begins.

Limitation of Liability

EXCEPT FOR CLAIMS FOR PERSONAL INJURY CAUSED BY ITEMS FURNISHED BY S-A, S-A SHALL NOT BE LIABLE TO THE CUSTOMER OR ANY OTHER PERSON OR ENTITY FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE TRANSACTION IN WHICH THE ITEMS OR SERVICES WERE FURNISHED OR ANY ACTS OR OMISSIONS ASSOCIATED THEREWITH OR RELATING TO THE SALE, LICENSE, OR USE OF ANY ITEMS OR SERVICES FURNISHED, WHETHER SUCH CLAIM IS BASED ON BREACH OF WARRANTY, CONTRACT, TORT, OR OTHER LEGAL THEORY AND REGARDLESS OF THE CAUSES OF SUCH LOSS OR DAMAGES OR WHETHER ANY OTHER REMEDY PROVIDED HEREIN FAILS. IN NO EVENT SHALL S-A'S TOTAL LIABILITY UNDER A CONTRACT OR PURCHASE ORDER FOR HARDWARE ITEMS OR SERVICES EXCEED AN AMOUNT EQUAL TO THE TOTAL AMOUNT PAID FOR SUCH ITEMS PROVIDED UNDER THE CONTRACT OR PURCHASE ORDER. IN NO EVENT SHALL S-A BE LIABLE TO CUSTOMER FOR ANY DAMAGES RELATED TO LICENSED SOFTWARE IN EXCESS OF THE LESSER OF TEN THOUSAND UNITED STATES DOLLARS (US\$10,000) OR THE LICENSE FEE PAID BY CUSTOMER TO S-A FOR THE LICENSED SOFTWARE.

Preface

About This Guide

Introduction

This guide provides the needed technical information to install the Dense QAM Array Power Supply Unit (PSU).

Audience

The audience of this user manual includes *users (operators)* and *service personnel* who are responsible for the installation, operation and service of the Dense QAM Array PSU. For further information about the definition of operator and service personnel, see safety guidelines and precautions earlier in this manual.

Scope

This guide provides the following topics.

- The PSU function description
- The installation procedures
- The technical specifications

Related Publications

Refer to the following Scientific-Atlanta publications for more information.

- *Continuum DVP Dense QAM Array System Guide, part number 698428, or Mercury Dense QAM Array System Guide, part number 4000997*
- *Continuum DVP Dense QAM Array Processor Module Installation and Operation Guide, part number 6984280, or Mercury Dense QAM Array Processor Module Installation and Operation Guide, part number 4000996*
- *Dense QAM Array Dual QAM Card Installation and Operation Guide, Part number 6984279*

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Chapter 1

Introduction

Overview

Introduction

This chapter provides a description of the Dense QAM Array Power Supply Unit (PSU) and the product identification.

In This Chapter

This chapter contains the following topics.

Topic	See Page
About the Dense QAM Array PSU	1-2
Product Identification	1-4

About the Dense QAM Array PSU

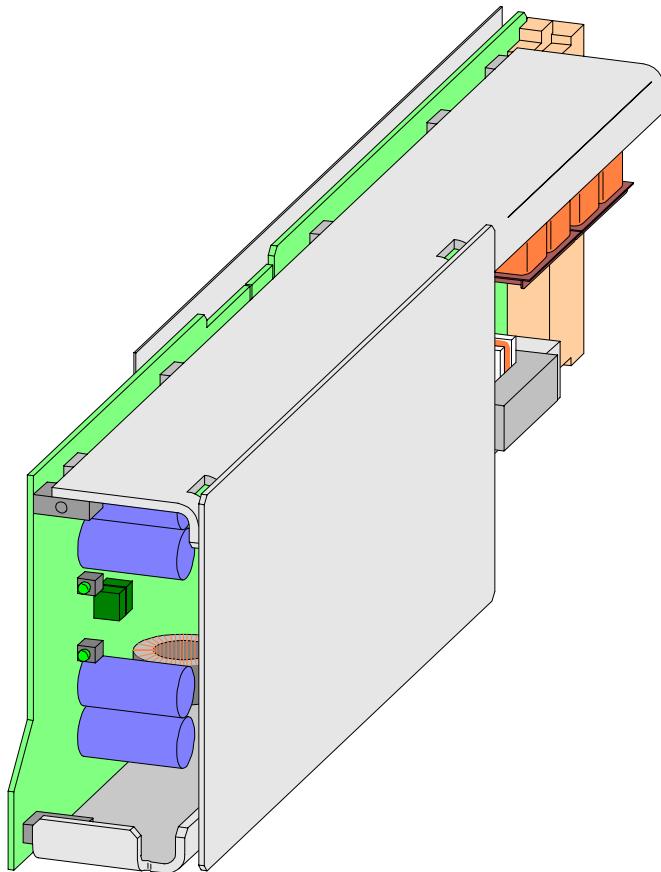
General

The Dense QAM Array Power Supply Unit (PSU) is a part of the Continuum DVP™ Dense QAM Array system or of the Mercury™ Dense QAM Array system. This PSU generates two 12 V DC supply voltages. One 12 V DC voltage (12 VA) supplies Dual QAM Card 1 up to 4 and the other (12 VB) Dual QAM Card 5 up to 8.

Two PSU versions are available, a 100-240 VAC version and a -48 V DC version.

Drawing

The following illustration shows a 100-240 V AC version PSU.



Continued on next page

About the Dense QAM Array PSU, Continued

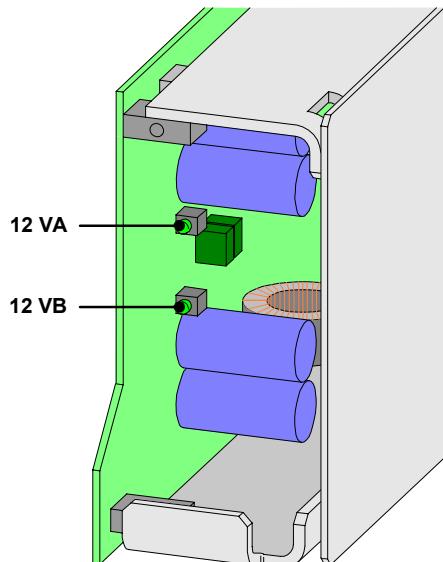
Features and Benefits

The standard features and benefits for the 100 - 240 V AC version PSU are:

- Universal AC input
- Inrush current limited, overvoltage protection and thermal shutdown
- Quasi-PFC
- 2 non-isolated fully protected 12 V DC outputs
- High efficiency
- High reliability

Indication LEDs

The PSU is provided with 2 LEDs that indicate the status of the 12 V DC supply voltages.



The following table describes the PSU LEDs.

LED	Color	Description
12 VA	Green	This led illuminates when the 12 VA is OK.
12 VB	Green	This led illuminates when the 12 VB is OK.

Product Identification

General

Products can be identified by means of the ID label attached to the product.

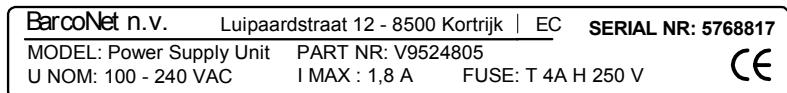
The following information is available on the label(s).

- Company address
- Model number
- Serial number
- Part number
- Nominal supply voltage
- Maximum current

Under some circumstances you might need this information. For example when a unit is failing, the serial number is necessary for returning your unit.

Label

The following is an example of the identification label:



The label is located on the rear side of the PCB.

Note: This identification label is an example and does not contain exactly the same information as the label attached to your unit.

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Chapter 2

Installation

Overview

Introduction

This chapter describes the installation of a Dense QAM Array Power Supply Module (PSU) in the chassis. It is assumed that all safety precautions and guidelines have been followed prior to performing the installation procedures in this chapter.

It is recommended that the entire installation procedure in this chapter is read prior to performing the Dense QAM Array PSU installation.

In This Chapter

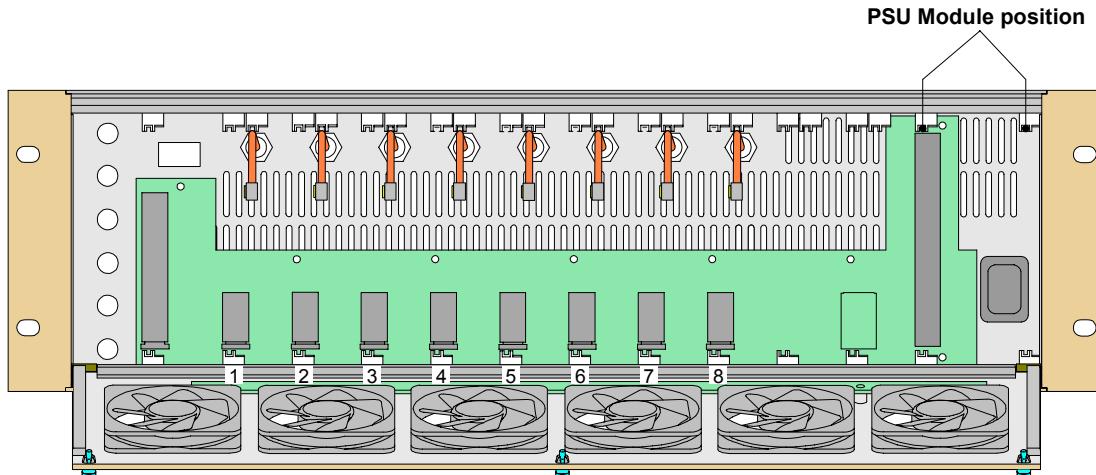
This chapter contains the following topics.

Topic	See Page
Installing the Dense QAM Array PSU	2-2
Removing the PSU from the chassis	2-5

Installing the Dense QAM Array PSU

Introduction

The PSU is positioned in the right most PCB slot of the Continuum DVP™ Dense QAM Array Chassis or of the Mercury™ Dense QAM Array Chassis. The following illustration shows the PSU slot in the chassis.



Observe the following cautions when installing the PSU.

CAUTIONS:

During installation, the connector on the PSU must line up evenly with the connector inside the card slot. When inserting the unit into the module slot, ensure that the unit is level and the top and the bottom sides slide evenly into the slot.

PSU contains static-sensitive devices. Always follow proper electrostatic discharge (ESD) handling procedures (wristband with ground strap and ESD mat) when installing cards in your chassis. Follow Electronic Industries Association (EIA) standard EIA-625.

Continued on next page

Installing the Dense QAM Array PSU, Continued

To Install the Dense QAM Array PSU

When you have read the safety guidelines and precautions, you are ready to install the PSU in the Continuum DVP Dense QAM Array Chassis or in the Mercury Dense QAM Array Chassis.

Perform the following procedure to install the PSU.

1. Unpack the PSU.

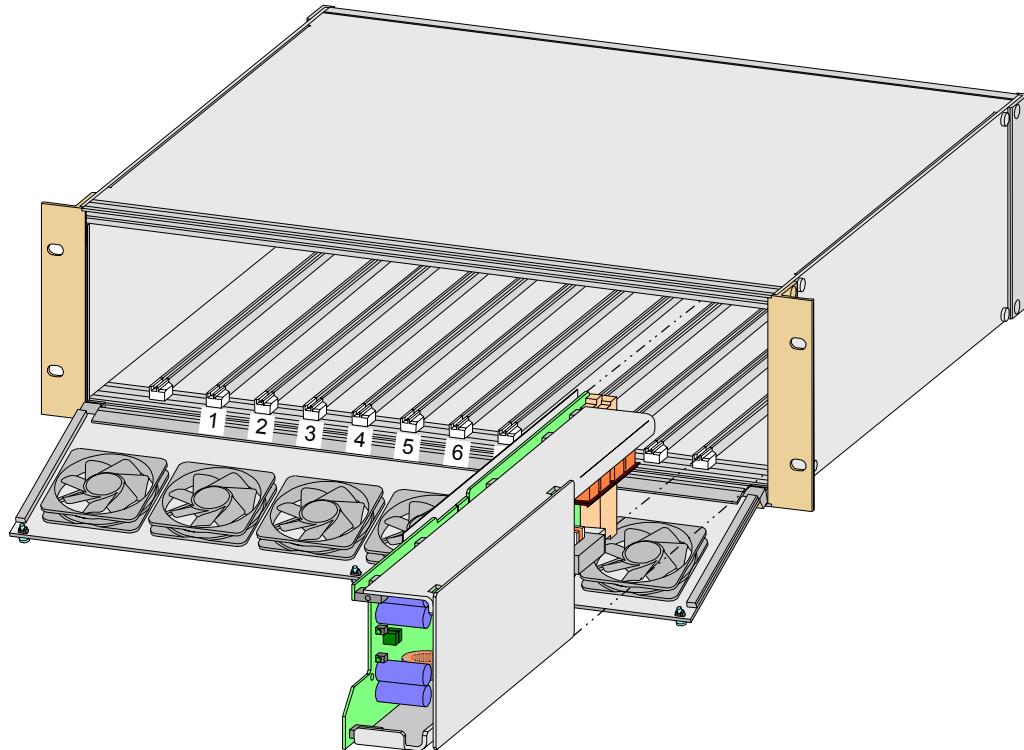


CAUTION:

**Follow proper ESD handling procedures.
ESD may cause permanent damage to electronic components.**

When unpacking a unit, examine it, the accessories, and the packing material for obvious signs of damage. Check the unit against the delivery/packing note. Retain the packing material, as it is required for warranty shipments and for later inspection by the carrier. Should any item be damaged, notify the carrier and your Scientific-Atlanta representative.

2. Loosen the three screws at the front of the chassis and open the front cover.
3. Slide the card in the card guides of the right-hand slot.



Continued on next page

Installing the Dense QAM Array PSU, Continued

4. Push the unit carefully into the back-plane connector.
5. Close the front cover and tighten the three screws.



CAUTION:

The six fans mounted on the front cover of the chassis assure sufficient cooling of the system only when the hinged front cover is closed. During operation of the system the front cover should be closed.

Ascertain that the cooling works properly during the operation of the system.

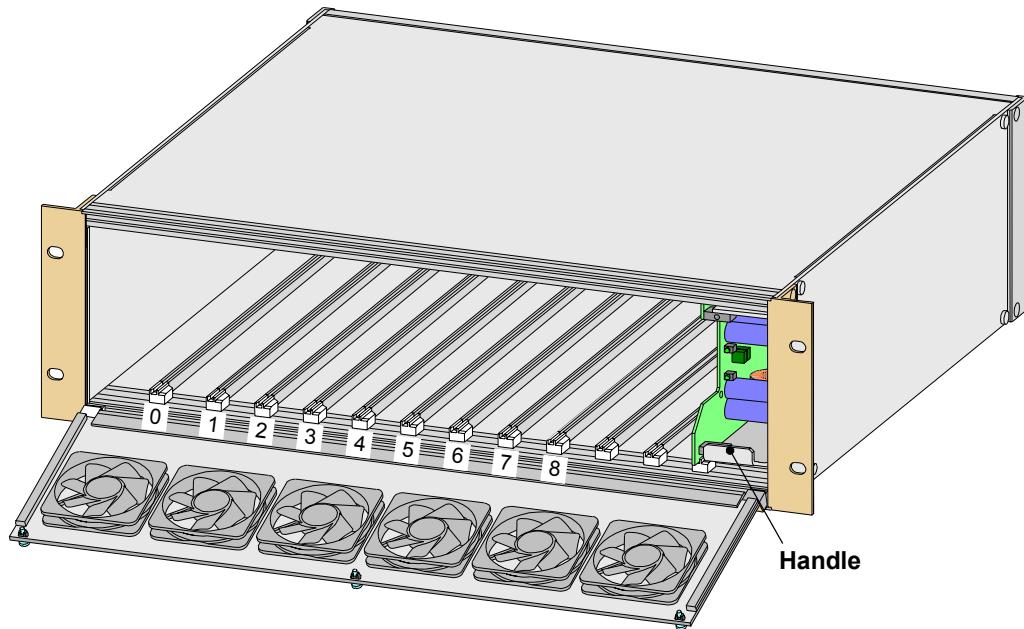
Removing the PSU from the chassis

To Remove a Dense QAM Array PSU

When you have read the safety guidelines and precautions, you are ready to remove the PSU from the Continuum DVP Dense QAM Array Chassis or from the Mercury Dense QAM Array Chassis.

Perform the following steps to remove the PSU from the chassis:

1. Loosen the three screws at the front of the chassis and open the front cover.
2. Pull out the PSU from the chassis using the handle (bended lip) on the front of the unit.



3. Close the front cover and tighten the three screws.



CAUTION:

The six fans mounted on the front cover of the chassis assure sufficient cooling of the system only when the hinged front cover is closed. During operation of the system the front cover should be closed.

Ascertain that the cooling works properly during the operation of the system.

Chapter 3

Customer Information

Overview

Introduction

This chapter contains information on obtaining product support and returning damaged products.

In This Chapter

This chapter contains the following topics.

Topic	See Page
Customer Information	3-1
Returning Products	3-4

Product Support

Obtaining Support

IF you have...	THEN...
general questions about this product	Contact your distributor or sales agent for product information.
technical questions about this product	Contact the customer services department.

Assistance Centers

Use the following table to find the assistance center in your area.

Region	Assistance Centers	Telephone, Fax Numbers and E-mail
North America South America Central America	SciCare™ Broadband Services - a division of Scientific-Atlanta Atlanta, Georgia United States	<ul style="list-style-type: none">For <i>Technical Support</i>, call: Toll-free 1-800-722-2009 Local 770-236-5400 Fax 770-236-5748For <i>Customer Service</i> questions, call: Toll-free 1-800-722-2009 Local 770-236-6900 Fax 770-236-5477
Europe	BarcoNet nv-Belgium - a Scientific-Atlanta company Luipaardstraat 12 B-8500 Kortrijk Belgium	Telephone 32-(0)56 445 197 Fax 32-(0)56 445 053 E-mail support@barconet.com
Europe	BarcoNet A/S- Denmark- a Scientific- Atlanta company Tobaksvejen 23A DK-2860 Søborg Denmark	Telephone 45 39 17 00 00 Fax 45 39 17 00 10 E-mail support.dk@barconet.com

Continued on next page

Product Support, Continued

Asia	BarcoNet Sdn. Bhd- Malaysia- a Scientific- Atlanta company Lot L1-E-3B Enterprise 4 – Technology Park Malaysia – Lebuhraya Puchong-Sg. Besi Bukit Jalil 57000 Kuala Lumpur Malaysia	Telephone 60 3 8996 1988 Fax 60 3 8996 1988 E-mail support.my@barconet.com
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Returning Products

Introduction

The procedure to return a product depends on the region where you are located. If you are located in North, South, or Central America, you should follow the procedure **Returning the Product to Scientific-Atlanta - North, South, or Central America**. If you are located in a region outside America, you should follow the procedure **Returning the Product to BarcoNet - Europe or Asia**.

Returning the Product to Scientific-Atlanta - North, South, or Central America

Introduction

Returning a product to Scientific-Atlanta for repair includes the following steps:

- Obtaining a return material authorization (RMA) number
- Packing and shipping the product

The following sections describe each of these procedures in detail.

Obtaining an RMA Number

You must have an RMA number to return products.

RMA numbers are valid for 60 days. If you already have a number, but it is older than 60 days, you must contact a Scientific-Atlanta SciCare Broadband Services representative to revalidate the number. You can return the product after the RMA number is revalidated.

Follow these steps to obtain an RMA number.

1. Contact a SciCare Broadband Services representative to request a new RMA number or revalidate an existing one.

You can either call a representative or fill out and fax an RMA Request form.

IF you want to...	THEN...
fax in an RMA Request Form	proceed to step 2.
call to request an RMA number	proceed to step 4.

2. Fill out the RMA Request Form, and fax it to SciCare Broadband Services at 1-770-236-5477.

Result: A customer service representative writes an RMA number on the form and faxes the form back to you.

3. Proceed to **Packing and Shipping the Product**.

Continued on next page

Returning Products, Continued

4. Telephone SciCare Broadband Services to request an RMA number.
Are you located within the United States?
 - If **yes**, call 1-800-722-2009.
 - If **no**, call 1-770-236-5300
5. Provide the following information to the customer service representative:
 - Product model number and/or part number
 - Number of products to return
 - Symptom(s) you are experiencing with the product
 - Your company name, contact, telephone number, fax number, and repair disposition authority
 - Any service contract details
 - Purchase order number, if available

Result: The representative issues the RMA number.

Notes: If you cannot provide a purchase order number:

 - A proforma invoice listing all costs incurred will be sent to you at the completion of product repair.
 - SciCare must receive a purchase order number within 15 days after you receive the proforma invoice.
 - Products can accrue costs through intentional damage or misuse, or if no problem is found. If your company requires a purchase order number to make payment for repairs, products incurring costs will not be dispatched to you without a valid purchase order number.
6. Proceed to **Packing and Shipping the Product**.

Continued on next page

Returning Products, Continued

Packing and Shipping the Product

Follow these steps to pack the product and ship it to Scientific-Atlanta.

1. Are the product's original container and packing material available?
 - If **yes**, pack the product in the container using the packing material.
 - If **no**, pack the product in a sturdy, corrugated box, and cushion it with packing material.

Important: You are responsible for delivering the returned product to Scientific-Atlanta safely and undamaged. Shipments damaged due to improper packaging may be refused and returned to you at your expense.

2. Write the following information on the outside of the container:
 - Your name
 - Complete address
 - Telephone number
 - RMA number

Note: Absence of the RMA number may delay processing of your product for repair. Make sure to include the number in all correspondence to Scientific-Atlanta.

3. Are you shipping the product from a location within the United States?
 - If **yes**, proceed to step 4.
 - If **no**, do the following:
 - Consign international shipments to Scientific-Atlanta, Inc., with the notified party on the Airway Bill stated as "Expeditors International for Customs Clearance".
 - Proceed to step 4.
4. Ship the product prepaid and insured to the following address.

Scientific-Atlanta, Inc.
RMA Number _____
Factory Services
4245 International Boulevard
Norcross, GA 30093
USA

Important: Be sure to prepay all shipments, as Scientific-Atlanta does not accept freight collect.

Continued on next page

Returning Products, Continued

Returning the Product to BarcoNet - Europe or Asia

Use the following procedure to return a unit for repair.

1. Contact the nearest customer services center to obtain a Return Authorization Number (RAN).

The customer services representative will ask for the unit's serial number, which is required to generate the RAN.

2. Ask the customer services representative to which customer center the unit should be returned.

It may be another than the one you contacted.

3. Package the unit carefully and include any information you can about the problems you are currently experiencing with the unit.

4. Attach the address label to the shipping carton. Be sure to include the RAN.

5. Ship the unit.

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Appendix

Appendix A—Technical Specifications



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Appendix A

Technical Specifications

Specifications

Introduction

The following tables list the technical specifications of the Dense QAM Array Power Supply Unit

Note: Technical specifications are subject to change without prior notice.

Environment Specifications

Item	Specification
Ambient temperature range:	
• Within specs	10 to 40°C / 50 to 104°F
• Operation	0 to 50°C / 32 to 122°F
• Storage	-20 to 70°C / -4 to 158°F

Physical Specifications

Item	Specification
Dimension	
• In mm	55 W x 100 H x 385 D
• In inch	2.2 W x 3.9 H x 15.2 D
Weight	1.3 kg / 2.86 lbs

Continued on next page

Specifications, Continued

Electrical Specifications

Item	Specification
Input voltage range	100 - 120 / 200 - 240 V AC
Output	Two non-isolated outputs 12 V DC Output voltage: 12.25 ± 0.25 V ($\pm 2\%$) No adjustments necessary.
Maximum Spec. SMPS (with forced air-cooling)	6.25 A on each output (150 W output power)
Maximum Load in application	5.2 A (120 W output power)
Nominal load in application	4.2 A (96 W output power)
Minimal load	0.25 A (to start up the SMPS)
Output current limit for each 12 V output	6.7 A (short circuit proof)
No derating over entire temperature range	Nominal load from 0°C (32°F) up to 45°C (113°F)
Efficiency	83%
Switching frequency	± 66 kHz (Forward converter)
No load input power	Max. 5 W
Inrush current limitation with NTC resistance	110 V: max. 50 A @ peak line 220 V: max. 100 A @ peak line
Fuse	4 A T (internal fuse size 5 x 20 mm)

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Glossary

Term, Acronym, Abbreviation	Meaning
DVP	Digital Video Platform
EIA	Electronic Industries Association
EMC	ElectroMagnetic Compatibility
ESD	Electrostatic Discharge
LED	Light Emitting Diode
PCB	Printed Circuit Board
PSU	Power Supply Unit
QAM	Quadrature Amplitude Modulation
RAN	Return Authorization Number
RMA	Return Material Authorization
SMPS	Switched Mode Power Supply

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Scientific Atlanta Europe GmbH, Westerbachstrasse 28, 61476 Kronberg, Germany; Tel: 49.6173.928.000
BarcoNet n.v. - Belgium, Luipaardstraat 12, B-8500 Kortrijk, Belgium; Tel: +32 (0)56 445 197

Asia-Pacific

Scientific Atlanta (Singapore) Pte. Ltd., 1 Claymore Drive, #08-11 Orchard Towers, Singapore 229594; Tel: 65.733.4314

Latin America

Scientific Atlanta Argentina S.A., Carlos Pellegrini 1149, Piso 11°, Capital Federal C1009ABW, Buenos Aires, Argentina;
Tel: 54.11.4325.2800

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Part Number 6984278 Rev A

Printed in Belgium July 2002